3D stereo reconstruction using sum square of difference matching algorithm

Abstract :

In this study, the Sum Square of Difference (SSD) matching algorithm is introduced to solve the matching ambiguousness between pixels using Quickbird images. This method is tested with three different types of template sizes of 3 × 3, 5 × 5 and 7 × 7 to acquire the best correlation of patches to be correlated. The matching is implemented with two different locations in the Quickbird images. The result shows that template size of 7 × 7 is most appropriate for matching with integrating of sum square of difference (SSD) matching algorithm. The correlation for first matching using template 7 × 7 is 0.8170 and for second matching is 0.8320. The RMSE for first matching is 8.51 and second matching is 8.332. First matching procedure shows lower value of matching pixels percentage value of 72% compared to second matching procedure with a percentage value of 76% pixels. It can be concluded that sum square of difference (SSD) is an appropriate method to solve the matching ambiguousness in high-resolution image such as Quickbird satellite data. It can be said that SSD matching algorithm can be used to acquire more accurate results for matching procedure